Research Paper Number 58

Do Housing Submarkets Really Matter?

Authors:
Steven C. BOURASSA - School of Urban and Public Affairs, University of Louisville
Martin HOESLI - HEC-University of Geneva, FAME and University of Aberdeen (Business School)
Vincent S. PENG - AMP Henderson Global Investors

Date:
November 2002

Bourassa, S.C., Hoesli, M., Peng, V.S. (2003): "Do housing submarkets really matter?", Journal of Housing Economics, 12, pp. 12-18.

Abstract:
We maintain that the appropriate definition of submarkets depends on the use to which they will be put. For mass appraisal purposes, submarkets should be defined so that the accuracy of hedonic predictions will be optimized. Thus we test whether out-of-sample hedonic value predictions can be improved when a large urban housing market is divided into submarkets and we explore the effects of alternative definitions of submarkets on the accuracy of predictions. We compare a set of submarkets based on small geographical areas defined by real estate appraisers with a set of statistically generated submarkets consisting of dwellings that are similar but not necessarily contiguous. The empirical analysis uses a transactions database from Auckland, New Zealand. Price predictions are found to be most accurate when based on the housing market segmentation used by appraisers. We conclude that housing submarkets matter, and location plays the major role in explaining why they matter.

Executive Summary:
Automated valuation models, usually multiple regression or hedonic models, are increasingly being implemented for mass appraisal and mortgage underwriting. These methods permit a rapid, cost-effective and objective valuation of a property or a portfolio of properties and are being used in several countries (such as the U.S., the U.K., Canada, the Netherlands, and Switzerland). The

multiple regression models that are used should provide price estimates that are as accurate as possible. In this context it is important to examine whether a given housing market should be considered as a whole, or whether a market should be considered as a set of submarkets.

For the purpose of examining whether out-of-sample valuations are improved when submarkets are considered, we use data pertaining to dwelling sales in the city of Auckland, New Zealand, in 1996. Two sets of housing submarkets are considered. First, we use the "sales groups" defined by real estate appraisers. There are 34 sales groups consisting of small geographical areas. Second, we use principal component analysis and cluster analysis to define submarkets. Factors are extracted from the variables using principal component analysis. Factor scores are calculated and cluster analysis is applied to those scores to construct housing submarkets. Then we estimate hedonic equations for the city as a whole and for each submarket and we evaluate the accuracy of out-of-sample predictions.
We demonstrate that housing submarkets defined as small geographical areas have more practical utility than submarkets defined using statistical techniques that disregard spatial contiguity. Adjusting for spatial dependence results in better predictions in most cases, although the degree of improvement depends on the level of spatial aggregation in the model. Not only do submarkets matter, but geography is what makes them matter.

"Location, location, location" is not just a tired dictum. Moreover, our conclusions underscore the value of the practical knowledge of appraisers. The broader implication of our results is that established neighborhood or other urban boundaries probably define suitable submarkets for mass appraisal purposes. In other words, it is probably not useful to employ elaborate statistical methods to define submarkets. However, such techniques may be useful in combining small geographical areas into larger areas for more basic research on the internal structure of cities. For example, such an approach could be employed to shed light on neighborhood patterns and dynamics.